

**What Is Claimed Is:**

1           1.    A method of signal path tracking for symbol timing  
2    recovery in a receiver, comprising the steps of:  
3           providing current sampling points for a received signal to  
4           generate current symbols according to a timing  
5           scheme;  
6           detecting optimal points of the current symbols for  
7           sampling the received signal;  
8           computing an expected error from the current sampling  
9           points and the optimal points; and  
10          adjusting the timing scheme to generate a future sampling  
11          point for a subsequent symbol according to the  
12          expected error, thereby recovering symbol timing of  
13          the receiver.

1           2.    The method according to claim 1, wherein computing the  
2    expected error further comprises:  
3           comparing the current sampling points with the optimal  
4           points to obtain timing differences;  
5           filtering the timing differences to obtain an average  
6           moving error; and  
7           integrating the average moving error to obtain the expected  
8           error.

1           3.    The method according to claim 2, wherein filtering the  
2    timing differences further comprises convolution and  
3    accumulation of the timing differences.

1           4.    The method according to claim 1, wherein the optimal  
2 points for sampling the received signal correspond with  
3 samplings of a maximum signal strength in each symbol duration.

1           5.    The method according to claim 1, wherein computation  
2 of the expected error occurs once every N symbols, and the  
3 current sampling points and the optimal points for computing the  
4 expected error are averages of the N current symbols.

1           6.    The method according to claim 1, wherein the timing  
2 scheme for sampling the received signal is adjusted to continue  
3 alignment of a sampling clock transition with an optimal  
4 sampling point computed by the expected error of a preceding  
5 symbol.

1           7.    A system of signal path tracking for symbol timing  
2 recovery in a receiver comprising:  
3           a symbol sampler, sampling a received signal at current  
4           sampling point according to a timing scheme;  
5           a peak detector, detecting optimal points for sampling the  
6           received signal;  
7           an error detector, computing an expected error from the  
8           optimal points detected by the peak detector and the  
9           current sampling points of the symbol sampler; and  
10          a path tracker, computing a future sampling point of a  
11          subsequent symbol and providing the future sampling  
12          point to the symbol sampler to adjust the timing  
13          scheme.

1           8.    The system for symbol timing recovery according to  
2 claim 7, the error detector further comprising:

3       a comparator, comparing the current sampling points of the  
4           symbol sampler and the optimal points detected by the  
5           peak detector to obtain timing differences;  
6       a loop filter, filtering the timing differences received  
7           from the comparator to obtain an average moving  
8           error; and  
9       an integrator, integrating the average moving error from  
10           the loop filter to obtain an expected error.

1       9.   The system for symbol timing recovery according to  
2   claim 7, wherein the optimal points for sampling the received  
3   signal correspond with samplings of a maximum signal strength  
4   in each symbol duration.

1       10.   The system for symbol timing recovery according to  
2   claim 7, wherein the error detector computes the expected error  
3   once every N symbols, and the current sampling points and the  
4   optimal points for computing the expected error are averages of  
5   N symbols.